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THE PROGRESS OF ARACHNOLOGY IN AMERICA.

BY LUCIEN M. UNDERWOOD, PH.D.

NOTWITHSTANDING all that is said and written to the contrary, the student of entomology still continues to do miscellaneous work in the "description of new and little known species;" and so long as this miscellaneous fever continues, so long must some one periodically gather up the fragments, in order to save future species-makers the trouble of re-describing what has already been fully described. In these days of such multiplicity of periodical literature it is difficult for the aspiring student—many times far away from the friendly counsel of some one wiser than himself, and away from the larger libraries that would supply many deficiencies—to know what others have already written on any particular family, and where the scattered literature may be found, in order that he may have a substantial basis on which to work. However a worker may modify his views later in life in regard to the proper methods and subjects for investigation, he will invariably develop his *enthusiasm*, if he have any, in a systematic study of some life-group in which his first ambition is to *name* the species of his collection. He may afterwards leave his first love as his mature views cause him to recognize the greater importance of morphological and embryological work, but he will rarely, if ever, commence his entomological career in any other way. Here our leaders in entomology may well take a suggestion, for at the early stages of systematic study too many young persons become hopelessly discouraged who might with proper encouragement become enthusiastic workers. Finding no accessible elementary aids to study, and finding such aids as do exist scattered through volume after volume of "Transactions" never found in their town or college library, they abandon a field in which they might make valuable additions to science for one whose entering pathway seems less beset with difficulties,—*i.e.*, they leave the study of entomology entirely.

Notwithstanding the many valuable papers that have appeared in recent years on our American Hymenoptera, we venture to predict that none of them will do so much to stimulate the study of this most interesting group of insects as Mr. Cresson's

"Synopsis of Families and Genera," which the author too modestly styles a "compilation." The reason is obvious; and those who desire to stimulate the beginner must proceed with eyes open, and bear the necessities of the case in mind.

It has been customary in many groups to publish periodical check-lists, which may possibly serve some useful purpose, but as a rule they are scarcely of a value equal to the labor bestowed upon them, since a little additional labor and a small increase of volume would make of a mere list of names a valuable index to the literature of an order and an outline of its known geographical distribution.

The literature pertaining to the American species of Arachnida, like that on most zoological groups, is exceedingly scattered, and up to the present time no *résumé* has been prepared that will at once place the student in the possession of the always welcome information regarding the present status of the subject.

The first recorded observations on the spiders of the North American fauna were by Lewis Bosc and Thomas Abbot, neither of which reached publication. Bosc left manuscript notes, together with colored drawings of twenty-five Carolina spiders, entitled "Sur les Araignées de la Caroline." The names of his species were published by Baron Walckenaer in 1805, but the descriptions did not appear until the publication of the first two volumes of "Apteres," in 1837. Thomas Abbot, better known by his work on the Lepidoptera, prepared an extensive series of illustrations of Georgian spiders, accompanied by manuscript "Notes and Observations on the Drawings of the Spiders of Georgia." Knowledge of the date of preparation of this series of drawings, as well as of its present place and condition of preservation, is wanting, but it was in London as early as 1802, and was purchased by Baron Walckenaer in 1821. Of the five hundred and thirty-five figures only three hundred could be classified with any certainty by Walckenaer, and the descriptions were published by him in his "Apteres." Very few of these species have been identified in recent times, owing largely, no doubt, to the fact that these southern tramping-grounds of the pioneers of American entomology have never been explored by recent investigators. As many of the species are based on color, which among spiders is exceedingly variable, rather than on more constant structural characters, there are doubtless many synonymes among them, if, indeed, they can ever be fully identified.

The writings of these pioneers were unknown to Say, who published in 1821 a paper on the lower Arachnida, describing twenty-four species of *Acarina* and eight species of *Arthrogastra.* As we have already published elsewhere bibliographic lists of these two groups,[1] we shall confine the account here given of the literature to the true spiders (*Araneæ*).

The work of Baron Walckenaer has been mentioned already in connection with that of Bosc and Abbot. In the first two volumes of "Apteres" he described two hundred and forty-four North American species, of which two hundred and twenty-six were from Georgia and Carolina. Of these, one hundred and seventy, over two-thirds, are distributed among the four genera,—*Lycosa,* twenty; *Attus,* sixty-six; *Thomisus,* twenty-seven; and *Epeira,* fifty-seven.

Nicholas Hentz began his study of the spiders of the Southern States in 1821, and his publications in the Journal of the Boston Society of Natural History from 1842 to 1850 form the basis of the study of arachnology in this country. These papers, with others by the same author, have since been reprinted in the "Occasional Papers" of the Boston Society (1875). Hentz described two hundred and fifty species, of which one hundred and ninety-nine, or four-fifths, were from the Southern States, chiefly North Carolina and Alabama, where he resided for a long time. Of these, one hundred and fifty have not yet been identified by recent investigators. Add to this number those described by Walckenaer, and we have from the Southern States alone a total of three hundred and seventy-five species of spiders which stand as mere names on our lists, with no specimens anywhere to represent them! As Hentz nowhere mentions Walckenaer's "Apteres," it is more than probable that he was not familiar with it, and that he redescribed some, if not many, of Walckenaer's species.

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[1] Preliminary List of the Arthrogastra of North America north of Mexico, in Canadian Entomologist, xvii. 162–169 (September, 1885), and Preliminary List of the Species of Acarina of North America, in Canadian Entomologist, xviii. 4–12 (January, 1886). There are as yet no additions to make to the former, except to note that *Gonyleptes ornatum* Wood has been set aside as a species distinct from *Cynorta ornata* (Say) under the name of *Cynorta sayii* Simon. When the latter list was published, the work of Hallier and J. B. Tyrrell on the Acarina parasitic on birds was unknown to both Professor Osborn and myself. A few species have been since described. These will appear shortly in a supplementary list.

Nothing more appeared until 1854, when Charles Girard published descriptions of *Mygale hentzii* and *Lycosa pilosa*, collected on Marcy's Red River expedition. The former is the "tarantula" of the Southwest, so commonly found in collections.

Ten years later (1864) Count Keyserling commenced a series of papers, largely on American spiders, which have resulted in some of the most extensive monographs that have appeared on the spiders of this or any land. The first two papers (1864–65) were on the Epeiridæ, or round-web spiders; later have appeared eight shorter papers, the last six (1879–84) forming a series entitled "Neue Spinnen aus Amerika." Most important of all, however, are his elegant quartos, ".Die Spinnen Amerikas," of which two volumes have already appeared. The first, on the Thomisidæ, or laterigrade spiders, appeared in 1880, and describes three hundred and fifteen species, of which one hundred and eighteen are new. These are from all America, South as well as North. The second volume, on the Therididæ, appeared in two parts (1884 and 1886), and describes three hundred and twenty-five species, of which two hundred and thirty-eight are new. One hundred and thirty-five, including seventy-five new species, are from North America; the remainder are from South America.

In 1869, Giebel described six species of spiders from Illinois, of which four were new. Two years later (1871) Anton Ausserer published extensive notes on the Mygalidæ, or trap-door spiders, of which a considerable number were from America. He gave a revision of the genera, which is now largely followed. In 1875 he published a supplementary paper on the same subject.

In the same year also appeared a paper by John Blackwall on spiders from Canada, describing five new species from the vicinity of Montreal.

Rev. O. P. Cambridge, the well-known author of "The Spiders of Dorset," published in 1874 and 1875 two short papers "On some New Species of Erigone from North America," and in 1881 a paper on "Newfoundland Spiders." In 1874, J. H. Emerton, who has done more in recent times than any other American to bring to light new forms of our spider fauna, commenced publication of the results of his studies. One of his first efforts was the editing, with valuable supplementary notes, of Hentz's writings, above mentioned. He afterwards (1875) published sundry notes in the AMERICAN NATURALIST on the cave spiders of Virginia, and described two species from Colorado as an appendix to one of Thorell's papers. In 1878 he published a popular elementary work on the "Structure and Habits of Spiders." This was largely used in the preparation of articles which were printed in the Report of the Entomological Society of Ontario for 1879, and in the "Standard Natural History." In 1882 he commenced a series of papers on the spiders of New England, and has already given us valuable monographs of the families Therididæ (1882), Epeiridæ (1884), and Lycosidæ (1885). He has in course of preparation papers on the other families of the same region. In these three papers he has described one hundred and seventeen new species, divided among the three families as follows: Therididæ, eighty-five; Epeiridæ, twelve; and Lycosidæ, twenty. This unusually large number results from the fact that previous workers had described species largely from the Southern States.

In 1875, Dr. Thorell, well known by his various works on European spiders as well as by various papers on the scorpions and opiliones, published a short "Notice of Some Spiders from Labrador," in which he described seven new species. Two years later (1877) he published a second paper, on the "Araneæ collected in Colorado in 1875 by A. S. Packard;" twenty-six species are described as new; this is almost the only paper that has yet appeared on the spiders of the region west of the Mississippi River.

Rev. H. C. McCook has published, in the Proceedings of the Philadelphia Academy (1876–83), a series of interesting papers on the habits of some of the web-building spiders; these include also the descriptions of some new species.

S. H. Scudder, in 1877, and Dr. George Marx, in 1881, described new species of Lycosidæ, with accounts of their nest-building habits.

In 1883 the Peckhams, of Milwaukee, commenced the publication of new species of Attidæ, or jumping spiders; twenty-five species are described, of which twenty-one are new.

Lastly, in 1886, Professor Atkinson, of Chapel Hill, N. C., in three papers, has described some new Mygalidæ, or trap-door spiders, from that region; many interesting notes of habits and nests are also given. A few other short papers will be referred to in the classified list of literature given below.

The above descriptive and systematic works describe from the region north of Mexico nine hundred and thirty-five species included in one hundred and thirty-seven genera. (This, of course, excludes those species which have been already reduced to synonymes.) They are distributed in families as follows:

	Genera.	Species.
THERIDIDÆ	44	268
EPEIRIDÆ	16	172
THOMISIDÆ	14	107
ATTIDÆ	12	156
LYCOSIDÆ	9	119
DRASSIDÆ	9	55
MYGALIDÆ	12	23
SPARASSIDÆ	4	7
DYSDERIDÆ	3	5
DICTYNIDÆ	2	6
AGALENIDÆ	2	3
ULOBORIDÆ	2	3
PHOLCIDÆ	2	2
SCYTODIDÆ	1	1
Of uncertain relations	5	8
Totals	137	935[1]

Of course, the above numbers may be somewhat reduced, as a study of Southern forms will cause an identification of Walckenaer's species with those of Hentz, with the usual harvest of synonymes.

So far as is known to us, only five persons are actively engaged in the study of the Arachnida in America.[2] J. H. Emerton is continuing his study of the spider fauna of New England; Professor Atkinson is at work on the Mygalidæ; the Peckhams are studying the Attidæ; and Dr. Marx, of Washington, will soon give us a revision of the scorpions. In Europe, Count Keyserling is continuing his researches, and will doubtless add

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[1] If we add to these the two other principal groups of Arachnida as already catalogued, we have:

	Families.	Genera.	Species.
ARANEÆ	14	137	935
ARTHROGASTRA	7	20	59
ACARINA	7	36	121
Totals	28	193	1114

[2] Since the above was written, we learn that Dr. McCook is preparing for the press an extensive work on the spinning habits of American spiders.

much to his already extensive contributions. It would seem that so interesting a group would attract a wider range of students, not only in systematic work, but in the investigation of the deeper and more fundamental questions of morphology and embryology, which offer a field almost wholly unexplored, full of questions waiting to be settled by careful extended study.[1]

In the study of geographical distribution other interesting questions offer themselves. Besides the problem of the spiders of the South above alluded to, which ought to demand immediate attention from some one, the great interior is almost wholly unexplored in reference to its spider fauna; Thorell's few species from Colorado and a few others described by Keyserling represent the condition of our knowledge of this region. From the Pacific coast comes a more pressing need for study, as scarcely a score of species have been described from California.[2]

As among many groups of life forms, both plant and animal, there is greater need of revision of families than there is of the miscellaneous and often hurried description, here and there, of a few "species supposed to be new" by some one only partly familiar with the literature of the subject. We can better afford to wait five or ten years for a monograph of a family prepared by some one who has thoroughly studied and compared the American species, than at the end of the same period to be obliged to search hither and yon for descriptions written by

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[1] We would not neglect to mention in this connection the valuable paper by Mr. William A. Locy: "Observations on the Development of *Agelena nævia*," published by the Museum of Comparative Zoology at Cambridge.

[2] If we compare the distribution of a single family, the Epeiridæ, as now known from the various parts of America, it will probably serve as a type of the distribution of the entire group of the Arachnida. Of the one hundred and seventy-two described American Epeiridæ we have:

Of general distribution (at least east of Sierras)	2
Generally distributed east of the Mississippi	25
Confined to Northern States	25
Confined to Southern States (south of Virginia)	93
(This includes seventy-one of Walckenaer's species and fourteen of Hentz's not recently identified.)	
From New England (exclusively)	17
From Mississippi Valley (north)	4
From Rocky Mountain Region (Colorado and Utah)	3
From California	2
From Texas	1

Compared with these figures Simon described seventy-three species in "Les Arachnides de France" and Westring thirty-four species in "Araneæ Suecicæ."

various persons, whose over-anxiety for fame could not resist giving premature birth to "sundry new species."

Meanwhile, well-constructed synopses that represent careful comparisons and will serve as a thorough index to what is known of a subject are not out of place, and will greatly assist beginners in their study. In this matter our American arachnologists may well pattern after the elegant models set them by Simon and Keyserling, in placing a carefully prepared synoptic table of genera and species at the head of each article. A descriptive work without such a synopsis is as faulty as a work of reference without an index or a library without a card catalogue.

In order to render this paper practical for students who desire to enter this attractive group of animal life, we present, first, a synoptic table of families, translated from Simon's admirable "Les Arachnides de France," followed by a summary of the literature of the American species:

ARANEÆ.

SYNOPSIS OF FAMILIES.[1]

A.—Copulatory organ of the ♂ enveloped by the tarsal article of the maliped,[2] which is hollowed in the form of a cupule, or, at least, much enlarged; ♀ with an epigyne[3]..........B

Copulatory organ of the ♂ inserted under the tarsal article [of the maliped] without modifying its form; ♀ without an epigyne..........S

B.—Eyes equal or sub-equal, often dissimilar,[4] forming a transverse group wider than deep on the anterior portion of the cephalothorax (sub-order, **Ar. veræ**) E

Eyes unequal, always similar, occupying the entire length of the head, and forming a group as deep or deeper than wide (sub-order, **Ar. oculatæ**).....C

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[1] Before an attempt is made to use this table, the reader may, with profit, study the structure of the large spider which commonly builds its nest in the form of a tube with spreading mouth about houses and in the grass. The males will be readily distinguished by their enlarged "palpi." The female reproductive organs will be found at the base of the abdomen below. This spider is the *Agelena nævia*, belonging to the first family under "R."

[2] The *patte-mâchoire* of Simon is, perhaps, best called *maliped;* it is the "palpus" of most American writers.

[3] The *epigyne* represents the whole of the external generative organs of the ♀. In its fundamental form it consists of two sacs, which connect by two little tubes with the oviduct near its mouth, and by two larger tubes with the outside of the spider. *Cf.* Emerton, "Structure and Habits of Spiders."

[4] This refers both to structure and function; two sorts of eyes are found in certain spiders,—(1) convex, round, colored eyes, adapted to diurnal vision, and (2) flat, uncolored eyes of various shapes, adapted to nocturnal vision.

C.—Cephalothorax raised, prismatic; face triangular.......................................D
Cephalothorax truncate anteriorly; face quadrate; eyes in three rows (4, 2, 2)..**Attidæ.**[1]
D.—Eyes placed in four rows (2, 2, 2, 2)...................................**Oxyopidæ.**[2]
Eyes placed in three rows (4, 2, 2)...**Lycosidæ.**
E.—Tarsi with three claws...I
Tarsi with two claws...F
F.—With three pairs of spinnerets..G
With only one pair of spinnerets...PALPIMANIDÆ.
G.—All the eyes similar, diurnal; second pair of legs longer than the fourth, and often than the first..H
Anterior median eyes diurnal, all the others nocturnal; second pair of legs longer than either the first or fourth...**Drassidæ.**
H.—Maxillary lamellæ[3] straight; fillet[4] very narrow............................**Sparassidæ.**
Maxillary lamellæ inclined much beneath the anterior portion of the sternum; fillet large..**Thomisidæ.**
I.—♀ with a calamistrum[5] and a cribellum..K
♀ with neither calamistrum nor cribellum..M
K.—Eyes dissimilar, equidistant, forming two parallel lines....................**Dictynidæ.**
Eyes similar, the lateral (at least the posterior) much removed from the median L
L.—Cephalic portion very convex, strongly separated from the thoracic portion; median eyes unequal, forming a compact group, separated from the lateral by two lines...ERESIDÆ.
Cephalic portion flat, indistinct; median eyes equal, little removed from the lateral of the first row...**Uloboridæ.**[6]
M.—Tarsi provided with a third article (onychium)[7]..N
Tarsi formed of only two articles..P
N.—With two pairs of spinnerets, the lower more developed....................ENYOIDÆ.
With three pairs of spinnerets...O
O.—Spinnerets equal, arranged in a rosette, all of a single article.........**Pholcidæ.**[8]
The upper [spinneret] much longer, formed of two or three articles..HERSILIDÆ.
P.—Fillet as wide or wider than the ocular area...Q
Fillet narrower than the ocular area..R
Q.—Cephalothorax oval, elongate, the cephalic portion narrow, raised; spinnerets equal, all formed of a single article.......................................**Therididæ.**
Cephalothorax short, rounded or reniform, the cephalic portion not narrowed; upper spinneret long, of two articles..................................UROCTEIDÆ.

[1] Families known to be represented in the United States are in bold-face type, others in small capitals.

[2] This is placed by American writers with the Lycosidæ.

[3] The *maxillary lamellæ* are enlargements of the coxal articles of the malipeds.

[4] The *fillet* is the space between the eyes and the base of the mandibles (*cheliceres*.)

[5] The *calamistrum* is a comb of stiff hairs on the penultimate joint of the fourth leg. The *cribellum* is an additional spinning organ covered with fine tubes and placed in front of the spinnerets.

[6] Emerton, following Blackwall, places the species of this family in the Ciniflonidæ.

[7] The legs in most spiders are formed of seven articles; the onychium, which appears in three families, forms an eighth.

[8] Emerton unites this family with the Therididæ.

R.—Median anterior eyes diurnal, all the others nocturnal; ♂ genital article cup-shaped, covering the copulatory organ; epigyne of ♀ in the form of a plate...**Agelenidæ.**

Eyes (or, at least, the four anterior) all diurnal; ♂ genital article laciniate, encompassing the copulatory organ; epigyne of ♀ provided with a hook or finger...**Epeiridæ.**

S.—Mandibles (*cheliceres*) inserted vertically, their second articles bending under the internal side; eyes 6, nocturnal (sub-order, **Ar. gnaphosæ**)..................T

Mandibles inserted horizontally, their second articles bending longitudinally downward; eyes 8, of which two are diurnal (sub-order, **Ar. theraphosæ**) U

T.—Eyes forming a compact group...**Dysderidæ.**

Eyes disposed in three separate groups...................................**Scytodidæ.**[1]

U.—With a single pair of epigastric stigmata; ♀ with a calamistrum..FILISTATIDÆ.

With two pairs of epigastric stigmata; no calamistrum............**Avicularidæ.**[2]

The following is a classified arrangement of the principal literature on American spiders, which will summarize what has been somewhat briefly reviewed above. A few of the most important European works are added, as they contain much of general value on the subject:

I. GENERAL.

BARON WALCKENAER.—Histoire Naturelle des Insectes,—Apteres. Tome i. et ii., on Araneina (1837).

N. M. HENTZ.—Descriptions and Figures of the Araneides of the United States; in *Jour. Boston Soc. Nat. Hist.*, iv. 54–57, 223–231, 386–396 (1842–44); v. 189–202, 352–369, 444–478 (1845–47); vi. 18–35, 271–295 (1850). Reprinted with other papers in one volume,—The Spiders of the United States. 8vo. Boston (1875).

CHARLES GIRARD.—Arachnidians; in App. F to Marcy's "Report of Red River Expedition," 233–235 (1854).

C. G. GIEBEL.—Ueber einige Spinnen aus Illinois; in *Zeitschrift für die Gesamm. Naturwissensch.*, 1869, 248–253.

JOHN BLACKWALL.—Notice of Spiders captured by Miss Hunter in Montreal, Upper Canada, with descriptions of species supposed to be new to arachnologists; in *Annals and Mag. of Nat. Hist.* (fourth series), viii. 429–436 (1871).

T. THORELL.—Notice of some Spiders from Labrador; in *Proc. Boston Soc. Nat. Hist.*, xvii. 490–504 (1875).

——Araneæ collected in Colorado in 1875 by A. S. Packard, Jr., M.D.; in *Bull. U. S. Geol. Survey* (Hayden), iii. 477–529 (1877).

J. H. EMERTON.—Cave Spiders from Virginia; in *American Naturalist*, ix. (1875).

——Spiders Common to New England and Europe; in *Psyche*, i. 129–131 (1876).

——Structure and Habits of Spiders. 12mo. Salem (1878). Copious abstracts of this popular work appear in the "Annual Report of the Entomological Society of Ontario" for 1879, and in vol. ii. of the "Standard Natural History."

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[1] Emerton unites this family with the Therididæ.

[2] More commonly known in this country as the Mygalidæ, or trap-door spiders.

GRAF. EUGENE KEYSERLING.—Amerikanische Spinnenarten aus den Familien Pholcoidæ, Scytodoidæ und Dysderoidæ; in *Verhandl. d. k. k. zool.-bot. Gesellschaft*, xxvii. 205–234 (1877).

——Neue Spinnen aus Amerika, vi. Theile; in *Verhandl. d. k. k. zool.-bot. Gesellschaft*, xxix. 293–350 (1879); xxx. 547–582 (1880); xxxi. 269–314 (1881); xxxii. 195–229 (1882); xxxiii. 649–684 (1883); xxxiv. 489–534 (1884).

O. P. CAMBRIDGE.—Newfoundland Spiders; in *Proc. Royal Physical Soc. Edinb.*, 1881.

II. EUROPEAN.

E. SIMON.—Les Arachnides de France, tome i.–v. Paris (1874–84).

O. P. CAMBRIDGE.—The Spiders of Dorset; with appendix, containing descriptions of those spiders not yet found in Dorsetshire. 2 vols. Sherborne (1879–81).

T. THORELL.—On European Spiders. Part I.—Review of the European Genera of Spiders. Upsaliæ (1869–70).

——Remarks on Synonyms of European Spiders (1870–73).

A. MENGE.—Preussische Spinnen. Danzig (1866–79).

L. BECKER.—Les Arachnides de Belgique. Bruxelles (1882).

WESTRING.—Araneæ Suecicæ (1861).

III. SPECIAL LITERATURE ON LEADING FAMILIES.[1]

A. EPEIRIDÆ.

GRAF. E. KEYSERLING.—Beschreibungen neuer und wenig bekannter Arten aus der Familie Orbitelæ Latr. oder Epeiridæ Sund.; in *Sitzungsber. des Isis zu Dresden*, 1863, 63–154 (1864).

——Beiträge zur Kenntniss der Orbitelæ Latr.; in *Verhandl. d. k. k. zool.-bot. Gesellschaft*, xv. 799–856 (1865).

J. H. EMERTON.—New England Spiders of the Family *Epeiridæ;* in *Trans. Conn. Acad.*, vi. 295–342 (1884).

B. G. WILDER.—[Notes on *Nephila plumipes*] in *Proc. Boston Soc. Nat. Hist.*, x. 200–210 (1865).

H. C. MCCOOK.—On Webs of New Species of Spiders (verbal communication); in *Proc. Phila. Acad.*, 1876, 200, 201.

——The Basilica Spider and her Snare; in *Proc. Phila. Acad.*, 1878, 124–135.

——The Snare of the Ray Spider (*Epeira radiosa*),—A New Form of Orb-Web; in *Proc. Phila. Acad.*, 1881, 163–175.

——How Orb-Weaving Spiders make the Frame-work or Foundation of Webs; in *Proc. Phila. Acad.*, 1881, 430–435.

——Snares of Orb-Weaving Spiders; in *Proc. Phila. Acad.*, 1882, 254–257.

GEORGE MARX.—Description of *Gasteracantha rufospinosa;* in *Entomologica Americana*, ii. 25, 26 (1886).

See also *Simon*, Les Arachnides de France, tome i.

B. THERIDIDÆ.

GRAF. E. KEYSERLING.—Die Spinnen Amerikas. II. Therididæ. 1 Hälfte, Nürnberg (1884). 2 Hälfte, Nürnberg (1886).

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[1] Besides the following special papers on each of these families, many species are described in most of the general papers above named, which it is not necessary to repeat here.

O. P. Cambridge.—On some New Species of *Erigone* from North America 2 parts; in *Proc. Zool. Soc. London.* 1874, 428–442; 1875, 393–405.

J. H. Emerton.—New England Spiders of the Family *Therididæ;* in *Trans. Conn. Acad.*, vi. 1–86 (1882).

See also *Simon*, Les Arachnides de France, tome v.

C. THOMISIDÆ.

Graf. E. Keyserling.—Die Spinnen Amerikas. Laterigradæ. 4to, pp. 283. Nürnberg (1880).

H. C. McCook.—Note on the probable Geographical Distribution of a Spider by the Trade Winds; in *Proc. Phila. Acad.*, 1878, 136–147.

See also *Simon*, Les Arachnides de France, tome ii.

D. ATTIDÆ.

G. W. and E. G. Peckham.—Descriptions of New or Little-Known Spiders of the Family Attidæ from various parts of the United States of North America. Pp. 36. Milwaukee (1883).

H. C. McCook.—Note on Two New California Spiders and their Nests (verbal communication); in *Proc. Phila. Acad.*, 1883, 276–278.

See also *Simon*, Les Arachnides de France, tome iii.

E. DRASSIDÆ.

C. L. Koch.—Die Arachniden Familie der Drassiden. Nürnberg (1866–68).

O. P. Cambridge.—On some New Species of Drassides; in *Proc. Zool. Soc. London*, 1874, 370–419.

See also *Simon*, Les Arachnides de France, tome iv.

F. LYCOSIDÆ.

Graf. E. Keyserling.—Ueber Amerikanische Spinnen Arten der Unterordnung Citigradæ; in *Verhandl. d. k. k. zool.-bot. Gesellschaft*, xxvi. 609–708 (1876).

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——New England Spiders of the Family *Lycosidæ;* in *Trans. Conn. Acad.*, vi. 481–505 (1885).

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HISTORY OF GARDEN VEGETABLES.

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(Continued from page 912.)

EGG-PLANT. *Solanum melongena* L.

THE egg-plant seems not to have been known in Europe in the time of the ancients. The Arab physician, Ebn Baithar, who wrote in the thirteenth century, speaks of it, and cites Rhases, who lived in the ninth century.[2] Albertus Magnus,[3] who lived in Europe in the thirteenth century, mentions it,—"Et sic inveninutur tres sapores in melangena, amarus acutus et stypticus." Ibn-al-awan, a Moorish Spaniard of the twelfth century, describes four species, and the Nabatheenne agriculture six.[4] According to Jessen,[5] Avicenna, who flourished about A.D. 595, knew it, and called it Badingan. This latter word, variously spelled, is the present name in Hindustanee, Arabic, Persian, and Sumatran,[6] and the closely corresponding English[7] name in India is Brinjal, and Begoon;[8] in Spain, Berengena; or at San Domingo, Beringene.[9] Bretschneider[10] says the egg-plant can be identified in the "Ts'i min yao shu," a Chinese work on

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[2] De Candolle, Orig. des Pl. Cult., 229.

[3] Albertus Magnus, De Veg., Jessen ed., 1867, 204.

[4] Ibn-al-awan, Le Livre d'Agriculture. Trans. of Clement-Mullet, 1886, ii. pt. 1, pp. 236–239.

[5] Albertus Magnus, l. c., note.

[6] Birdwood, Veg. Prod. of Bombay, 173.

[7] Drury, Useful Pl. of Ind., 410.

[8] Firminger, Gard. in Ind., 155.

[9] Heuze, l. c., ii. 695.

[10] Bretschneider, Bot. Sin., 59.